BOOK REVIEWS

STORTI, F., HOLDSWORTH, R. E. & SALVINI, F. (eds) 2003. *Intraplate Strike-Slip Deformation Belts*. Geological Society Special Publication no. 210. viii + 234 pp. London, Bath: Geological Society of London, Price £65.00, US $108.00; members' price £32.50, US $54.00; AAPG members' price £39.00, US $65.00 (hard covers). ISBN 1 86239 132 7.
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Geological Society Special Publication 210 contains a collection of papers devoted entirely to strike-slip tectonics – specifically intra-plate strike-slip deformation belts. The introductory paper by Storti *et al.* contains a very useful review of current ideas concerning intra-plate strike-slip deformation belts. The paper is well referenced and focuses the reader on the importance of these structures both in terms of localizing deformation and their role as major sources of long-term mechanical anisotropy in the lithosphere. The following paper by Vauchez & Tommasi retruns to the topic of lithospheric anisotropy and coherent deformation of the entire lithosphere using a combination of geological and geophysical observations, from a wide variety of examples around the globe. This is followed by the lone analogue modelling paper by Guido Schreurs, detailing experiments of distrubuted strike-slip shear zones. This paper presents both a useful summary of previous modelling work combined with well-illustrated models using a novel and original approach to generate distributed shear in the overburden.

The remaining 10 papers deal with natural examples of intra-plate strike-slip deformation belts from the India–Eurasia collision-escape belt, Antarctica, North America to South America. Buslov *et al.* document recent deformation in the northern Tien Shan and in particular postulate a pull-apart origin for the Issyk–Kul Basin that is surrounded by the heavily deformed Kungey and Terskey ranges. Further to the northwest, Cunningham *et al.* present a superbly-illustrated (once you look at the Erratum) synopsis of transpressional and strike-slip uplift in the Mongolian Altai. A recurring theme is how the geometric relationship between rigid basement blocks and maximum shortening direction has dictated deformation kinematics in this region (see the paper by Marshak *et al.* for similar discussions). The final paper in this section is a regional study of basin development in northern Thailand by Uttamo *et al.* The authors split the 42 basins into five distinct types (pull-apart, fault-tip, fault-wedge, fault-zone and extensional basin) from their study of Landsat TM imagery of this region, providing a very useful structural summary on the complex tectonics of northern Thailand.

Papers by Ferraccioli & Bozzo and Rocchi *et al.* focus on the structural geology in and around the Ross Sea region, Antarctica. Ferraccioli & Bozzo utilize aeromagnetics for their study on the Wilkes Subglacial Basin and the western margin of the Ross Sea Rift and present compelling evidence for Cenozoic strike-slip faulting along an inherited fault system termed the Prince Albert Fault System. The intersection of this fault zone and the McMurdo Sound fault zone define a transtensional margin to the Ross Sea Rift. Rocchi *et al.* present a complimentary paper on the strike-slip and transtensional origin of major Cenozoic magmatism in the Ross Sea Region rather than a plume-driven event. In this case structures formed during the late Cretaceous amagmatic extensional rift phase were reutilized during the Cenozoic and dynamically linked to the Southern Ocean fracture zones. Perritt & Watkeys present the third paper in this section on Antarctica with a study of Pan-African shearing in Dronning Maud Land on the opposite of the continent and the implications this has for Gondwana reconstructions and correlation of events in southeast Africa.

Marshak *et al.* present a broad-ranging paper on Phanerozoic intra-continental deformation in North America and relate the regional pattern of shear sense to a 'jostling block' model whereby a strong continental lithosphere undergoing indentor-style collision deforms by reactivation of pre-existing N- to NE- and W- to NW-trending fabrics inherited from Proterozoic–Cambrian rifting events. During Palaeozoic and Mesozoic–Cenozoic collision events the strong lithosphere focused deformation along the rectilinear block boundaries, and sense of slip on these inherited fabrics depended on individual block geometry rather than regional shortening trajectories. This, the authors contest, is in sharp contrast to central and southern Eurasia where an already weakened continental lithosphere allowed significant strain to be transferred to the continental interior generating major strike-slip faults and escape structures. The other paper in the North American section is by J. B. Murphy who presents a paper on protracted intracontinental strike-slip and the formation of the St Mary's basin, Nova Scotia.

In the final two papers we travel to South America. Reijs & McClay document the Pliocene–Recent Salina del Fraile sinistral pull-apart basin in the Argentine Puna Altiplano. Although I am biased towards this basin the paper is very well illustrated and shows a beautiful example of a well exposed, starved, sub-mature pull-apart structure. In the paper by Mohriak & Rosendahl we move to the east coast of South America and northwestern coast of Africa to examine transform zones using seismic, potential field and borehole data from conjugate basins along this margin. This paper is the only one in the volume to discuss intraplate strike-slip deformation belts from a divergent setting. The data indicate that fracture zones penetrate continental crust, reusing Precambrian structures in cratonic regions, to control rift architecture. The result is the compartmentalization of the continental margin, localized shearing along these structures and disruption of the basin fill during the early stages as complex plate tectonic readjustments occur prior to the inception of an active ocean spreading centre.

In summary, this is a useful collection of papers on strike-slip tectonics. The papers are generally well illustrated, although there are one or two figures that could have used a 'touch-up' or perhaps more standardization for such a volume – a bit more colour would not go astray either. My only gripe is that there are few 'general' papers and nothing on numerical modelling and thus the volume is heavily weighted towards case studies. Having said that, there are relatively few volumes entirely devoted to strike-slip tectonics, and many of the case studies are multi-disciplinary, so this is a welcome addition and should appeal to advanced structural geology students, graduate students and any workers in this field.

Tim Dooley

BROOKFIELD, M. E. 2003. *Principles of Stratigraphy*. x + 340 pp. Oxford: Blackwell Publishing. Price £29.99 (paperback). ISBN 1 4051 1164 X.
DOI: 10.1017/S0016756804229880

Do we need another textbook in the field of stratigraphy, sedimentology and basin analysis? A trawl through the reference list in this book shows that at least 28 treatises and textbooks in these fields have been published in English since 1982. The author would say 'Yes', his justification being a holistic approach to his subject. For him, the study of stratigraphy must cover a very wide field, including – with some justification – the whole of sedimentology, tectonic controls on deposition, the effects of controls such as climate and sea level, as well as stratigraphic classification and correlation, and basin analysis.

So does the book succeed in its aim? Well, up to a point. The problem with this approach is to cover such a wide range of topics adequately. In the present book, even in 290 pages of the main text, many subjects are dealt with too summarily. To mention extreme examples, eight lines are all we get on isopachyte maps and nine deal with sediment provenance. Four pages (about one page of text) on Biology are hardly adequate.

Stratigraphical principles in the strict sense are dealt with fairly briefly. 'A [biostratigraphical] zone is an assemblage of guide fossils . . . ' is a misleading statement, as a zone is generally agreed to be a stratal unit defined by fossils. Arkell (1956, p. 5), to whom the definition is attributed, wrote '*The hallmark of* a zone is the assemblage of guide fossils . . . '

Notwithstanding the logical subdivision of the subject matter, several topics recur in different chapters; for example, Vail's familiar diagrams of continental margin sequences appear in almost identical form on pages 173 and 195. The concept of sequence stratigraphy recurs in several places and it would have been useful if these discussions could have been brought together.

The author has a healthily sceptical attitude towards received wisdom and his critical discussion is often refreshing. Subjects such as the reality of worldwide 'eustatic' changes in sea level, and the supposed isochrony of unconformities in sequence stratigraphy, among others, are discussed effectively. The role of tectonics in controlling sedimentation is stressed and isostasy is discussed at some length.

The book is well illustrated. In fact, the page area devoted to illustrations probably exceeds that of text. Line illustrations are almost all appropriate and clear. Most are from previous sources, though apparently re-lettered in uniform style. The smaller number of reproductions of photographs are less successful. They are often dark and muddy and do not help to illuminate the text.

The preface tells us that the book is intended to back up a second-year university course, presumably in stratigraphy as defined by the author. Given that students will be studying other aspects of earth science, besides, perhaps, ancillary subjects, the scope does seem unrealistically wide.

Overall the book is disappointing, an interesting but perhaps unrealistic aim only partly achieved.

Desmond Donovan

Reference

ARKELL, W. J. 1956. *Jurassic Geology of the World*. Edinburgh: Oliver & Boyd.

KORNPROBST, J. 2002. *Metamorphic Rocks and Their Geodynamic Significance. A Petrological Handbook*. Petrology and Structural Geology Series Vol. 12. Originally published as *Métamorphisme et roches métamorphiques. Signification géodynamique* by Dunod, Paris, 2001. Translated by E. H. Chown. xvi + 208 pp. Dordrecht, Boston, London: Kluwer. Price Euros 55, US $61, £38 (hard covers). ISBN 1 4020 0893 7.
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Kornprobst's book is a well-structured basic production, matured throughout lectures given at the universities of Paris, Clermont-Ferrand and Lyon. It received three editions in French and the present English edition is a second printing.

Metamorphic features tell the history of the solid rocks – the tale of increased or depressed heat, of the isotropic or stressed environment, of depth changes. The mineralogical and chemical changes of the rock and fluid systems have to be analysed and quantified, and their significance assessed before information can be delivered to other branches of geology. As indicated in the title, the book is divided into two parts, which might be labelled tools and inferences.

The first part of the book falls into three sections: (1) the factors and mechanisms of metamorphism; notions are examined, diagrams explained, units defined, formulas given – all metamorphic tools are inspected and these often arid matters are dealt with simply and clearly; (2) metamorphic structures; and (3) the evaluation of physical and chemical metamorphic conditions, a chapter where the metamorphic facies, the geometrical analysis of the systems and the instruments for thermometry and barometry are discussed. The importance of specific approaches such as metamorphic geochronology, thermodynamics, etc., is emphasized and references given.

The second half of the book concerns the geodynamic inferences to be drawn from the results acquired. Types of metamorphism are examined: the contact and the regional types of various pressure/temperature regimes. The French–Spanish Pyrenees and the French Massif Central serve as examples, but case studies are taken from other classical or less widely known geological regions, such as the Alps, Scotland, the Himalayas, the Franciscan, Oman, Madagascar, the Urals, etc.

The book is richly illustrated with 127 diagrams, sketches and maps. Appendixes and tables complete the book. The text is clear, rigorous but fluent, concise but with enough flesh around the bones; the translation reads easily. Kinetic aspects might have received more development owing to their great influence on the metamorphic processes. The appearance in figures of unconventional units – Km, Kb and Kg, for km, kb and kg – is regrettable.

This basic book will be valuable to many petrologists and geologists ranging from undergraduate students to experienced research workers, as a reference book where all concepts concerning metamorphism can be acquired, revised or updated.

Jacqueline Desmons